

# Flexible, Lightweight, Low-Cost Organic Photovoltaics with Improved Efficiency, Phase II

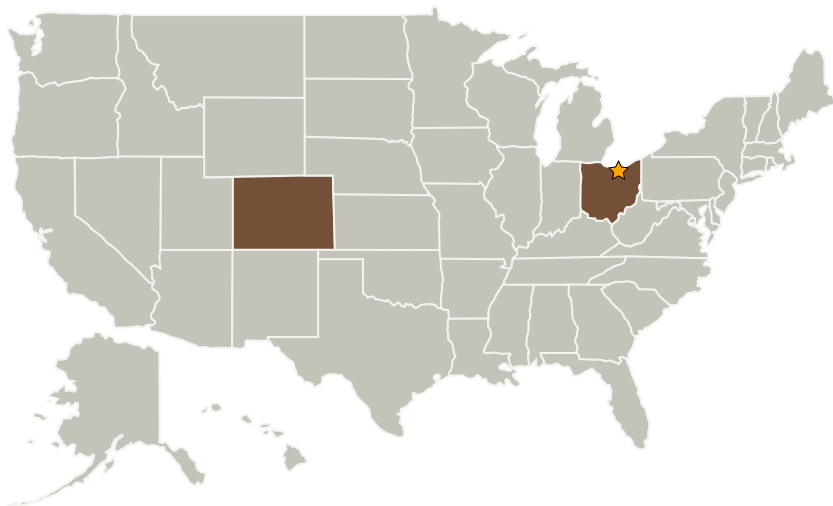
Completed Technology Project (2009 - 2011)



## Project Introduction

Both manned and unmanned off-Earth missions of the future will require very lightweight, inexpensive, high efficiency, flexible and single-use photovoltaic (PV) arrays to generate electric power. Current PV technology horizons do not meet the requirements for expanded mission capability. Although inorganic PVs hold the record for solar power conversion efficiency, they are inflexible, heavy, and expensive to produce. There is increasing interest in a new type of PV technology that is based on organic semiconducting materials. However, the performance of these devices has been limited by the availability of stable n-type (acceptor) organic semiconductors. TDA Research, Inc. proposes to use a new class of n-type conjugated polymers to produce more efficient organic PV devices (OPVs). The first generation of our new acceptor materials is already commercially available through Sigma-Aldrich, and the current technology readiness level (TRL) at the end of the Phase I stands at 4 with proof-of-concept results, OPV prototypes, and commercial sales. A successful Phase II project will lead to several commercial n-type organic semiconductor products being sold by Sigma-Aldrich to both the research and commercial markets, and the use of our products in the full scale production of lightweight flexible OPVs (TRL 6-7).

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Glenn Research Center (GRC)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
TDA Research, Inc.	Supporting Organization	Industry	Wheat Ridge, Colorado

Primary U.S. Work Locations	
Colorado	Ohio

## Project Transitions

**September 2009:** Project Start**September 2011:** Closed out

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX03 Aerospace Power and Energy Storage
  - └ TX03.1 Power Generation and Energy Conversion
    - └ TX03.1.1 Photovoltaic